

CLAIMS

1. A gene encoding a protein that has an activity of regulating the pH of vacuoles in plant cells.

5 2. A gene encoding a protein that has the amino acid sequence as set forth in SEQ ID NO: 2 and that has an activity of regulating the pH of vacuoles in plant cells.

10 3. A gene encoding a protein that has an amino acid sequence modified by the addition or deletion of one or a plurality of amino acids and/or substitution with other amino acids in the amino acid sequence as set forth in SEQ ID NO: 2 and that has an activity of regulating the pH of vacuoles.

15 4. The gene according to claim 1 encoding a protein that has an amino acid sequence having a identity of 20% or more with the amino acid sequence as set forth in SEQ ID NO: 2 and that has an activity of regulating the pH of vacuoles.

20 5. The gene according to claim 1 encoding a protein that has an amino acid sequence having a identity of 70% or more with the amino acid sequence as set forth in SEQ ID NO: 2 and that has an activity of regulating the pH of vacuoles.

25 6. The gene according to claim 1 that hybridizes to a part or all of a nucleic acid having a nucleotide sequence encoding the amino acid sequence as set forth in SEQ ID NO: 2 under a stringent condition, and that encodes a protein having an activity of regulating the pH of vacuoles.

30 7. A vector comprising the gene according to any one of the claims 1 to 6.

8. A host cell transformed with the vector according to claim 7.

35 9. A protein encoded by the gene according to any one of the claims 1 to 6.

10. A method of producing a protein that has an activity of regulating the pH of vacuoles, said method

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Q2

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Q3

comprising culturing or growing the host cell according to claim 8 and then harvesting said protein from said host cell.

5 11. A plant in which the gene according to any one of the claims 1 to 6 or the vector according to claim 7 has been introduced or an progeny thereof having the same property as said plant, or a tissue thereof.

10 12. A cut flower of the plant according to claim 11 or an progeny thereof having the same property as said plant.

15 13. A method of regulating the pH of vacuoles comprising introducing the gene according to any one of the claims 1 to 6 or the vector according to claim 7 into a plant or plant cells and then allowing said gene to be expressed.

20 14. A method of controlling the flower color of plants comprising introducing the gene according to any one of the claims 1 to 6 or the vector according to claim 7 into a plant or plant cells and then allowing said gene to be expressed.